

1 Q. **Reference: Application, Schedule 1: Upgrade Report – Penstock 1 Life Extension – Bay**  
2 **d'Espoir, Page 16, lines 12-14.**

3 During the risk workshop, the risk of a minor penstock failure for Option 1 was  
4 assigned as 16, the highest possible risk score. The group assumed, based on  
5 historical failures, that if operations continue as “Status Quo,” Penstock 1 was  
6 “Highly Likely” to experience a weld failure (potentially as often as every second  
7 year).

8 a) Based on Hydro’s experience with minor penstock failures since 2016, what outage duration  
9 would likely be experienced if these failures occurred every second year?

10 b) Has Hydro assessed the risk of a major penstock failure? If yes, provide the assessment  
11 including outage duration and cost to repair. If not, why not?

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14 A. a) Newfoundland and Labrador Hydro (“Hydro”) assumes a typical outage duration, stemming  
15 from an unanticipated rupture, to be in the range of two to three weeks. This outage  
16 duration estimate can be impacted by items such as time of year, ease of access (i.e., slope),  
17 extent/type of repairs required, and ability to mobilize any external resources required.

18 b) Hydro has included the risk of a major penstock failure within the risk assessment portion of  
19 Appendix K.<sup>1</sup>

20 This risk was applied to Option 1 (status quo) and assessed for a major rupture both  
21 upstream and downstream of the surge tank. The probability of these risks was assessed as  
22 either “unlikely” or “very unlikely.” Order of magnitude costs and outage durations for these  
23 failures were found to be in the “\$500k to \$5M” or “\$5M+” categories and the “1 Month to  
24 4 Month” categories or “4 + Months” categories, dependent on the specific nature of the  
25 failure. It should be noted that a major penstock failure at the Bay d'Espoir Hydroelectric

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<sup>1</sup> “Application for Approval of Capital Expenditures for Section Replacement and Weld Refurbishment for Bay d'Espoir Hydroelectric Generating Facility Penstock 1,” Newfoundland and Labrador Hydro, December 7, 2022, sch. 1, app. K, app. A, Task 4, pp. 133–153.

- 1           Generating Facility would be catastrophic, with a wide range of potential impacts, making a
- 2           detailed cost estimate of the potential impacts highly speculative.